SEPTEMBER 1953
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Tic

PEDODONTIA

(SEE BACK COVER)

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midzimu

Dear Doctor,

The Haitians have a word for it!

They believe that their "midzimu" (the spirits of their ancestors) take a lively interest in the living. To the Haitians it is a serious thing! What they do, and how they do it, is greatly influenced by the midzimu.

We call it black magic, luck or voodoo!

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Your Technicians Laboratory

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A MAGAZINE FOR DENTISTS, DENTAL ASSISTANTS, AND DENTAL HYGIENISTS

September 1953, Vol. XII, No. 9

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What Is My Financial Future In Dentistry?

by M. A. Patrick

You are a dentist. That means you are in a professional calling which distinguishes you from the business man and the wage-earner, yet, like the butcher, the baker, and the electric-bulb maker, you, too, must enjoy an incoming flow of dollars with which to feed, clothe, and otherwise provide for yourself and your family. Thus, at least one of your problems is comparable to that faced by most other men who are not independently wealthy.

This fact—particularly the regularity of the monetary return from your efforts—logically brings up the question, "What are my chances of maintaining an adequate income in the immediate and distant future?" If you are around thirty-five and your practice has developed satisfactorily, you may not attach any question mark to the regularity of the dollar return from your profession. Except for some physical misfortune it may seem unlikely that there would be anything but an upward turn in your financial position. This type of optimism may be commendable but it is one of the handicaps of the specialization necessary in building a professional background. As a dentist you are not required to study economic trends carefully and regularly.

Actually, the income from the practice of dentistry is linked with many things not directly related to oral health. It hinges, for instance, on the number of marriage licenses issued, the volume of cars produced in Detroit, the temperatures of the hot and cold wars. And the financial stability of the dental profession also depends on you.

"Luxuries" and Dentistry

That last factor, you, deserves first consideration in any study of the dependability of dentistry's dividends. During the last dozen years more people have regularly visited more dentists than during any previous period. It would be encouraging to think that these men and women made appointments for chair time because individual practitioners had convinced them of the vital need for periodic dental care. But unfortunately this is not true. Dentists have been busier because their patients have

had more dollars to spend on luxuries. Yes, "luxuries" is the correct word. Dentists who operated during the Thirties will agree as they recall that many folks with limited funds were then inclined to replace the chipped gear teeth in their cars before purchasing needed dental restorations for themselves. They had not been educated to understand the importance of good oral health to the same extent that they had been made familiar with the danger of neglecting teeth in their car's gear box. Should the children of these men and women ever face a condition that would require them to choose between making a TV payment or arranging for a dental appointment, only good dental education will direct them wisely.

The spreading of this type of knowledge is the reason you as a dentist have been mentioned among the factors on which the prosperity of dentistry depends. The "you" in this case is plural because the needed results call for collective action.

The tactics of one eastern dentist might be considered as contributing to making people dentistry-conscious. Every now and then when talking with a patient in the chair he will remark, "Teeth are intended for chewing not for food storage." The subject is not too pleasant but it is easily remembered and a man who later senses some trouble in his mouth and recalls the comment is likely to take steps to correct the "food storage" condition. On occasions when speaking with a young man this dentist recalls the experience of a patient who gained new confidence in his position after some dental corrections permitted him to display his winning smile without embarrasment. And women who sit in his chair are likely to learn all about the part teeth play in maintaining and supporting youthful facial appearance.

These and other bits of information the practitioner passes on to patients are not presented in objectionable preaching fashion but injected interestingly as part of the small talk he uses to fill in the pauses in his operations. Without appearing to "sell dentistry," he nevertheless convinces patients that their present and future time in the chair represents a contribution to better health and increased attractiveness. His appeals to the continued interest of patients in regular dental care takes the viewpoint of a layman appraising the finished results of a practitioner's work. In the field of public relations, this is known as the "you appeal," and it is important in safeguarding dentistry's financial future because it is one factor the dentist may control.

With marriage licenses, cold and hot wars, and auto production, the situation is much different. Although they may influence the number of his productive chair hours, the dentist is not in a position to regulate them.

Economists who are constantly appraising the financial future are right now of the opinion that defense spending will not play as important a part in national production volume as is generally supposed. This does not mean that its total will not be large but rather that it will change very little this year unless something unforeseen develops on the international scene. These authorities, however, are watching the falling number of marriage licenses being issued. The 1952 figure shows a drop of nearly 750,000 below the record 1946 total. Fewer weddings mean a lessening of demand for many items and while the dentist does not benefit directly through the sale of wedding dresses, travel tickets, pots and pans, and home-furnishings, those who work in these fields may be among his patients. The incomes they derive from purchases made by new family units seep through to practitioners as these individuals arrange for dental care.

SORE SPOT

When you bill a patient
You're sure to observe
That there's more than one way
Of exposing a nerve!

(Mildred Mason)

The answer to the question presented earlier in this discussion—"What is my financial future in dentistry?"—may be summed up in a few words. Future financial prospects should be satisfactory when appraised in the light of expected national economic conditions. In one specific instance the dollar income of a certain practitioner is likely to be even better than in the past, and for a very good reason. "When I have a patient in my chair," he explained recently, "I try to think of that man or woman continuing to make appointments three, four, or five years from now." Projecting his thinking into the future, he feels, is a sure aid to speaking and acting in a manner that helps maintain the good will of the patient. This special effort to hold down patient turnover also is an effective way of prompting patients to mention the dentist's name to their friends and acquaintances.

Without realizing it, this practitioner is using the "you appeal" to build security into his own practice, and since he as an individual reflects favorably on dentists everywhere, he contributes beneficially to the entire profession.

Dollars are necessary to you as a dentist but dollars are linked inseparably to the number of names in your appointment schedule. It logically follows therefore that patients are very important people. If you develop their confidence in you as an individual, as well as a dentist, and improve their awareness of the necessity of good dental care, then your financial future in dentistry will be safer in spite of changes in the number of marriage licenses, the quantity of automobiles produced, and the temperatures of hot and cold wars.

The Controversial Finger-Sucking Habit

by Theodore Katz, D.D.S., and Harold Gluck, Ph.D.

Part II

One of the leading research specialists dealing with the problem of finger-sucking is Doctor Samuel J. Lewis, who certainly came right to grips with the question when he himself raised a basic question: "Have we scientifically and biologically sound evidence to substantiate the statement that thumb-sucking does operate as a cause of a definite type of malocclusion or malformation of the deciduous teeth and dental arches?"[5]

Making first a survey of leading authorities, he concluded that the authors of the foremost books on orthodontics have widely varying opinions on the effect of thumb-sucking on the teeth and dental arches, and also that no author offers evidence to prove or disprove his opinion regarding the relation of thumb-sucking and malocclusion of the deciduous teeth. He presents in his study results based upon a questionnaire and models taken of the teeth. And here we do have scientific evidence to back up his statement that "Thumb-sucking is a cause of malocclusion in the deciduous teeth. In a majority of cases (twenty-four out of thirty in the present study), it is associated with a typical malocclusion or deformity of the deciduous teeth, characterized by a forward displacement of the upper incisors and the premaxillary bone, and, at times a retrusion of the lower incisors. As a rule, the displacement is toward the side of the thumb sucked; when both thumbs are sucked, the displacement is symmetrically." And: "There is a general tendency for malformations resulting from thumb-sucking to correct themselves if the habit is broken by the time the child is 5 years of age; but the malformations do not, as a rule, correct themselves if the habit persists."

In presenting a sound program for giving parents advice on how to handle thumb-sucking we must bear in mind the important warning sounded by Doctor Edward S. Mack, when he wrote: "In the controversial subject of thumb-sucking, there are two principal schools of thought, the psychological and the dental. And the two have never met. This has resulted in confusion on the part of the mother as to what course of action to follow. Shall she risk the danger of psychological frustration in the child or a dental deformity?"[6] And it is most important that a mother get her advice from the source best suited to handle the situation. Nothing is more dangerous than half-truths or opinions based on nothing more than outmoded theories or subjective feelings.

It is submitted that a mother should consult the dentist in regard to the problem of thumb-sucking and that he should be the center of any program which it may be necessary to initiate. In order to get a whole comprehensive picture of the child, so that the best remedial measures be taken, it is conceivable that the parent might also have to get advice from a general medical practitioner, a pediatrician, a nurse, a psychiatrist, a psychologist, and a school teacher. But the center should be the dentist. The goal should be that expressed by Paul J. Mandabach, Sr., when he wrote: "That the child of today and tomorrow will not have to go through the ordeal of malocclusion as it happened with my children—that the mothers and fathers of today and tomorrow do not have to suffer what my wife and I suffered in correcting teeth deformities in our children . . . "[7]

A Long-Range Program

The following should be in any long-range program which is planned intelligently to handle the problem of thumb-sucking:

1. The preparation of material for the mother and an educational drive so that the mother is

"WHEN WILL IT EVER END, MISS NELSON— WHEN WILL IT EVER END?"

THE RIGHT TREATMENT

I don't find it odd

When a patient concedes

A good paste in the mouth

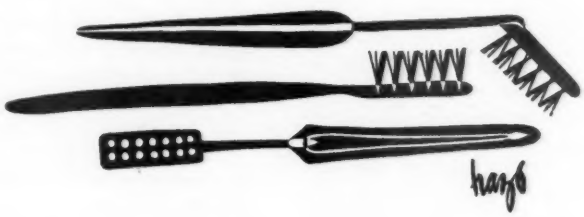
Is one thing that he needs.

Mildred Mason

given a background to enable her to understand thumb-sucking in its various stages and thus be prepared to use preventive measures. One immediately thinks of the study by Doctors Maury Massler and Arthur W. S. Wood as the type of material that could be expanded and comprehensively illustrated.[8]

2. The dentist as the center of any program when it becomes necessary to take measures to handle a thumb-sucker. If this is to be interpreted as meaning the dentist is to handle a given child as a case history and study, then the program must be carried out to this logical conclusion.

3. The dentist as the person who makes the final determination of what is to be done with a thumb-sucker. Since he is often consulted first, he should get a complete case history. This should include the age when the thumb-sucking was first noticed; the length of time it actually first took place; any associated movements; and X-rays and models of the child's mouth. In other words, get all the facts first before reaching any conclusions.



In conclusion, we submit the following for consideration as facts, and they should be given an important part in any sensible program to be set up in order to help the thumb-sucker break the habit:

1. In infancy, finger-sucking is a normal activity that requires no interference. All agree that it is a normal habit in the first two years of life.

2. Its persistence during the third and fourth years may be due to an underlying emotional conflict of which thumb-sucking is a symptom.

3. After the age of five and as the child approaches eight, nine, and ten, a definite psychological technique is often necessary. We should look for a psychological disturbance.

4. When chemical and mechanical methods are used to break the habit, be certain that the child will cooperate to a certain extent. After a trial period, if the method is causing a psychological reaction in the child, it may be wise to discontinue treatment.

5. Harsh and violent approaches or any display of a temper is out of consideration in handling a child. No matter how "obstinate" the child may seem to be, sympathy, love and understanding are needed as well as a continued search for the specific cause or causes in the individual child.

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SUCCESS?

There is no use to stall around,
  A dentist likes his ease.
Well padded patients are the ones,
  He should strive to please.

Other things will fall in line,
  If he has quite a few:
Such as a big suburban home
  With a lovely view.

A maid, a car, a handy man,
  A cottage at the shore.
And though he has no time for them,
  What man could ask for more?

Ethel Willis Hewitt

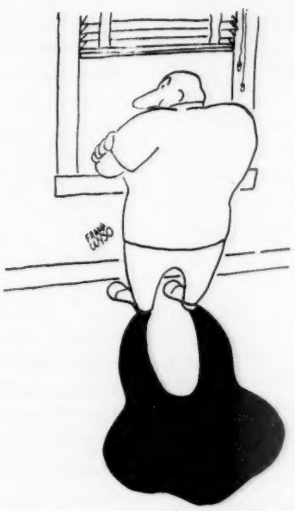
ANGLES AND IMPRESSIONS

Dental Thisa and Data:

Preliminary impressions from an American dentist in England: Large signs in London advertise, "All Dental Repairs Completed in 3 Hours!" . . . Five minute interviews with five Londoners (taxi driver, hotel clerk, sales clerk, blouse manufacturer, customer in department store) revealed the following attitude toward the $64-question, "What do you think about the British Dental Health Plan?": Indifferent, 1; favorable, 4. All agreed that it is the one program instituted by the Labor Government that the Conservative Party would not eliminate. However, revisions have been plentiful. Most recent change in the plan requires payment by the patient for any work done for which the fee is less than $3. This has been done to cut down on the "get-something-for-nothing, one-visit-complainers." . . . In the U. S.: Since the widespread use of fluorine in water, there have been numerous advocates of fluoridated table salt, chewing gum, mouthwashes, and now even milk. However, Doctor S. Pearlman, a spokesman for the Council of Dental Therapeutics of the A.D.A., has strongly advised against any such proposals. Said Doctor Pearlman: "Until an accumulation of scientific data indicates the usefulness of other procedures, the current method of fluoridation of domestic water supplies offers the only established means of reducing the incidence of dental caries on a popular basis. Untested alternatives . . . should not be advocated, since the true issue tends to become clouded in the resulting confusion."

Inci-dentals

Chlorophyll dentifrices have gone over big in the European countries. Stories of its popularity in Ireland have recently come to our attention. One assumes that it's the "wearin' o' the green" that gets them. . . . In Eastbourne, England, a pickpocket whose technique was a bit unusual was being sought by the police. His chief weapon was a tube of toothpaste. He would squirt toothpaste on his victim's clothing and then, with a pretense of helping them brush off their clothing, would pick their pockets.



Tic Tips

Here are some good suggestions from the U. S. Naval Dental School for the patient about to wear a set of artificial dentures for the first time.

Bring your teeth together often and swallow frequently.

When endeavoring to bite into such foods as apples or carrots, push the food inward and upward against the teeth. Don't try to bite into the food.

Try to chew with an up and down motion rather than side movements.

Try to keep the tongue low and forward in the mouth.

These suggestions will help immeasurably to keep both the upper and lower dentures more stabilized and firmly seated.

Tic Teaser

Can you fill in the definitions of the numbered phrases in the lines along side? There's a part of "dentist" in each one, so it shouldn't be too hard for you.

1. Artificial teeth	D E N T – – – –	– – – – I S T	1. Plays string instrument
2. Individuality	– D E N T – – –	– – – I S T –	2. Demands
3. Notched	– – D E N T – –	– – I S T – –	3. City in England
4. Abrasive dental units	– – – D E N T –	– I S T – – –	4. Water reservoir
5. Chance happening	– – – – D E N T	I S T – – – –	5. Narrow land connecting two large masses

See page sixteen for answers

DENTAL ANXIETY

by Edward Podolsky, M.D.

One of the most widely spread fears is fear of going to the dentist. So common is this that jokes, quips, cartoons and other forms of humor have presented many situations in which fear of going to the dentist is played up and emphasized. Even serious writers of fiction have, at one time or another, utilized this situation. It is a popular form of "humor" and literary expression because dental fear or anxiety is universally experienced. Dental anxiety may be slight, moderate or it may even take the form of excessive fear or dread.

Why is dental anxiety so widespread? In its most elementary expression, dental fear or anxiety is a true form of dreadful or fearful anticipation of something very unpleasant; namely, pain. This is the kind of anxiety that is motivated by pain or the anticipation of pain, which may occur even when nerve blocking is used. The pain may be real or emotional, but it is pain nevertheless.

However, the anticipatory fear of pain is not the whole story in dental anxiety. Dental anxiety has its roots deep in the psyche of the individual.

Kinds of Anxiety

Let us get some idea as to what anxiety is. Anxiety is the reaction to a specific danger situation, either real—which is found in the external environment—or fancied—which is within the individual, the internal environment. Anxiety is always related to expectation—expectation of something unpleasant that is to happen.

A real anxiety situation is a danger which is known, which is in view, something quite definite, a specific object or situation—such as fear of a wild animal, a falling rock, an automobile wreck. This kind of anxiety is easy to understand, because it is caused by something quite specific and tangible.

The other type of anxiety, neurotic anxiety, is fear of the unknown, the vague, the indefinite, the unseen, the unsuspected. In such a case the individual knows that he is afraid, but he does not know of what he is afraid. There is a sensation of impending doom, a pervading sense of oppression and discomfort. However, in this kind of anxiety, as well as in normal anxiety, the individual tries to use all sorts of devices to avoid danger.

Real and Unknown Dangers

In dental anxiety there is both fear of a real danger and of an unknown danger. The real danger is always distorted out of proportion to the situation which causes it. Pain is now easily controlled in dentistry, and most people know this; yet pain is recognized by them as the motivating factor in dental anxiety. It is, however, not this real danger which is important. It is the unknown, unconscious anxiety which is the cause, the real cause, of dental fear.

Psychoanalysts have advocated an interesting theory of dental anxiety, and it has, of course, for them, sexual connotations. It is their contention that tooth-losing dreams are universal, occuring among primitive tribes as well as in civilized people. In dreams the unconscious symbolic ideas of tooth, child and genital are associated and a dream of losing a tooth (which is a phallic symbol) is related to the fear of castration. Therefore, for the unconscious, treatment of extraction of a tooth is a castration symbol; hence the anticipatory dread or anxiety. Somehow, unconsciously this thought occurs in their minds: Going to a dentist means the danger of being castrated (losing a tooth equals castration); therefore a person fears going to a dentist.

Fear has many faces, but quite often one soil in which it is planted and nurtured. Fear is found most often in individuals who have unconscious and unresolved personal conflicts. It is in these persons that dental anxiety takes its severest form. Such individuals are already so sensitized that fear is brought to the surface on any thought of visiting the dentist or while sitting in the dental chair.

What does a person experiencing dental anxiety actually fear? He fears not dental manipulation but something deep within him—some deep, internal tension. In dental fear, this internal, unknown danger is transformed into an external one—at the moment dental fear, because it is within view and is being experienced at the moment.

Anxiety Protects

Anxiety is actually a form of protection, so that fear may be lessened. Anxiety protects from an overwhelming fear either through flight or through some other defensive maneuver. Quite often this other defensive device is dental fear.

From external danger one can defend oneself by running away; but one cannot run away from an internal danger. The only thing to do is to try to rationalize or to attempt to minimize the danger.

Dentists will want to keep this fact in mind: Neurotic anxiety is unconscious anxiety; real anxiety is conscious anxiety. Dental anxiety is an admixture of both types, but mostly it is the neurotic type of anxiety.

Dental Wives:

Wives Need Hobbies Too

by Kay Lipke

What happens when a girl with years of training in a skill or profession marries her dentist and settles down at home?

She keeps house, of course, and very often brings up a family. If she is socially minded, she joins organizations and meets with her friends in her spare time. She enjoys her life with her husband.

But what of the skill into which she put so much concentrated effort before her marriage? Is it to be wasted just because she no longer goes to an office each morning?

One dental wife solved this problem beautifully. She was a trained dental technician before her marriage, but her husband did not want her to continue to work. When her children were small and needed her, she devoted her time to them, but when they were in school she joined an adult education class in jewelry-making. Having been a skilled technician in an orthodontist's office, she had the necessary "know-how" for this type of work; furthermore, she was artistic by nature.

"NOW THERE'S NO NEED TO WORRY ABOUT JUNIOR, MRS. SAWYER. THE DOCTOR HAS A WONDERFUL WAY WITH CHILDREN."

That was many years ago. Today her jewelry is as professionally made as any purchased in a good jewelry store, and often far more original in design. It has been exhibited many times. Occasionally she sells some of her work, and now and then she creates jewelry to order. But for the most part it has remained a hobby which has absorbed her spare time and excess energy, and given happiness to her family and to her many friends.

"It is an expensive hobby," she told this writer. "However, it pays for itself. I usually sell enough to pay for my materials, and I make all the wedding gifts, as well as Christmas, birthday and graduation gifts, we give our friends and family. I love creating unusual pieces, and I like to keep busy. I couldn't live without a hobby."

We were sitting in her living room, surrounded by evidences of her work. Along with jewelry, she has taken up flower arrangement, ceramics, and all the kindred skills.

A beautiful silver punch ladle reposed on the coffee table. A spectacular arrangement of driftwood, wood roses and polished leaves occupied a low bowl on a carved chest. On a shelf over the fire place, were a pair of fragile ceramic vases. Everywhere I looked, I saw her work.

We laughed as we recalled the period several years ago when she and this writer's dental husband used to meet one afternoon a week to work in his small hobby shop in our garden. She taught him jewelry-making and he taught her some of the finer points of metal work, including silver plating.

Watching the two of them at work, one could appreciate how worthwhile a constructive hobby can be. The work itself breeds contentment, and the artistic result is tremendously satisifying.

One young wife has been going to an evening class in writing one night each week, while her husband baby sits with the children. She is writing short articles on subjects related to her daily problems with her home and children. She is selling, too.

In modern day living, with its tremendous challenges, there is no need ever for a dental wife to feel that her life and interests are narrowing down. Within us all are unexpressed talents which, if brought into the foreground, could add interest to our lives without detracting in the least from the main business of homemaking for our dentist-husbands.

R FOR LIVING

DR. CARL J. HENKELMANN—ARCTIC EXPLORER

by Joseph George Strack

Part One

To witness the impact of modern civilization upon a simple people, to see a primitive society's culture change under the influence of industrial factors, to observe the deterioration of oral health stemming from the adoption of new eating habits, and to observe the dissatisfaction and unhappiness that modern ways of living can bring to an untutored people—all this has been the experience of Doctor Carl J. Henkelmann, prominent explorer-dentist of Lincoln, Nebraska.

For five years Doctor Henkelmann has been making trips to Alaska. Back in 1948 he made his first trip, a dental survey of the Barrow, Alaska, Eskimos conducted by the Arctic Research Laboratories, for the United States Navy. At that time he charted the mouths of 550 Eskimos. Ever since, Carl Henkelmann has been charting, not only the oral health of the natives of Alaska, but, as it were, their whole culture, as the forces of civilized society have reacted, favorably and unfavorably, upon the primitive fishing and hunting economy of the Eskimo people. Year after year, he has returned by plane to his Eskimo friends for periods ranging from two to four months. He shoots, fishes, photographs, and relaxes; treats scores of Eskimos professionally; and records scientific, social, and historical data regarding the changing Alaskan scene.

Doctor Henkelmann in his plane, which he uses to fly to Alaska each year. A Piper Supercruiser, it carries the doctor, two passengers, and baggage. All of his flying is strictly "contact" and does not require any special instruments except an electric compass.

Standing under two whale ribs at Barrow, July 1948. From here it is 1,250 miles to the North Pole. This is the site of the old hunting ground—the farthest north tip at Barrow.

"My first trip was a professional project, but every trip since then—five in all—has been motivated by a number of interests," he explains. "Alaska is not far from Nebraska. I can step into my plane and, in a very real sense, step into a new world, in a matter of hours. This new world has a magic of its own: time seems to stand still. Life and all of its pressures are reduced to the elemental needs of human existence only. One cannot worry about anything except food, shelter, and clothing. Since we explorers are assured of those necessities, we find in Alaska nothing to worry about. We are utterly without tensions of any kind, a situation that would be unique in a so-called civilized society like our own."

He comments further in this connection: "We in civilized society are all too busy. We live too fast. We rush into middle age. Some of us even yearn for old age, so that we may retire and enjoy at least a few days of peace and relaxation. Too many of us, however, are beginning to learn that we cannot afford to retire. Why? Because we have found the soft spots in life, too many soft spots, and we don't wish to give them up! We would have to relinquish some of them on the reduced income of a retired dentist. So we realize that we must keep on going at full pace to pay for all the trivia and trinkets and toys of modern living that, we now know, we cannot do without. That kind of treadmill-living is one reason why I go to the magnificent silences, the natural beauties, and the refreshing simplicities of Alaska—and go for at least a few months of every year."

The Eskimo World

Doctor Henkelmann describes the Eskimo society at Anaktuvuk Pass, Alaska, in its severe primitiveness: a tribe of twenty-two Eskimos whose full time is occupied with getting food, maintaining shelter, and making clothes. He explains:

"A few years ago these tasks of obtaining the essentials of life constituted their whole existence. The men were hunting most of the time, bringing in caribou meat and hides and setting nets to catch fish. The women were cooking, repairing clothing, and making parkas and mukluks—surely a twelve-hour job where there were children in the family. The youngsters, by the way, would play games, bring in wood, pick berries or help their parents.

"In 1947 a scientific group of white men visited this tribe for the first time—the natives' first contact with civilization. Today the life of that Eskimo society has been changed. The men spend less time hunting, and the women spend less time sewing and cooking. More time is spent loafing—and more dependence is placed upon the white man's plane for clothing and food. The death of the battery of a portable radio becomes such a social catastrophe that it is equivalent, in the pall it spreads, to the

Many dentists will recognize this familiar exhibit, which Dr. Henkelmann calls "my convention set-up."

On the peak of a low mountain at the northernmost part the Brooks Range in Anaktuvuk Pass. The bleak Arctic Plains (tundra) lie in the background below. Travel would be most difficult without the home-made cane.

Removing "crowded teeth" at Anaktuvuk Pass, 1951. One of Dr. Henkelmann's Eskimo patients.

Cutting blubber away from seal hide.

Tanning caribou hide.

"Doris"

Edith Tegoseak preparing the operative set-up used at Point Barrow. With a minimum of instruction, she became an excellent assistant.

Mrs. Samuel Simmonds, the oldest woman at Point Barrow. Note the heavy chin marks visible. These marks used to be made when a woman married. This ancient custom was produced by using a sharp instrument to break the skin and make it raw. Then a permanent dye was rubbed into the wound.

death of a human being. The Eskimo is no longer satisified to hunt caribou with an old-calibre gun; he must now have the latest 257 Roberts or 270 Winchester, even though ammunition for the modern rifles is difficult to get and much more costly.

"The women now frequently order their shoes and clothes from mail-order catalogues, even though such footwear and clothing are quite impractical in Alaska, where, in some areas, temperature differences of 90 degrees above in summer and 60 degrees below in winter occur."

Two Radios in Every Home

Changes in living habits that are even more drastic, have occurred at Barrow, Alaska. When the United States Navy began to build a base at Point Barrow, Eskimos were employed—almost the entire Eskimo population of Barrow except children and women. The Eskimos were paid wages ranging from $300 to $600 monthly. The dollars of civilization made a tremendous impact upon the elemental Eskimo economy. The average Eskimo no longer hunts for his living; only the youngsters and some unemployed mature Eskimos hunt. Eating habits, too, have changed. The dollar-earning Eskimo has switched from seal, walrus, whale, caribou, and reindeer to white flour, cookies, syrups, jams, sugar, candy, and bubble gum—by the case! Some Eskimo families now have two radios, and keeping-up-with-the-Joneses is, believe it or not, a set of tensions that is being introduced for the first time into what once was a simple, satisfying way of life for a happy, child-like people."

Next month—*Part Two*

The "house" of the wealthiest man in Anaktuvuk Pass, a bent willow frame covered with caribou hide and canvas. On the left is his sled for winter use, and on the right is the mast for his radio.

Crossing the John River to go sheep hunting

"Elijah's wife."

"Susie"

Part IV: **The Removable Partial Denture**

FUNDAMENTAL PRINCIPLES IN PARTIAL DENTURE DESIGN

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by Joseph Murray, D.D.S.

Because constructing the removable partial denture is both a mechanical and biologic art, certain fundamental principles must be scrupulously observed to insure satisfactory results.

In the past, failure was frequently due to errors of omission. Thorough and proper preparation of the mouth before impression taking was often neglected.

Occasionally there was lack of careful diagnosis because study models were inaccurate and roentgenographs were ill defined. Sometimes the case was sent directly to the technician without even the above preliminaries, and without any attempt to survey or design the denture.

Often there was failure to utilize the fundamental principles of favorable leverage in design. At times destructive forces were not distributed and reduced for physiologic stimulation.

Frequently there existed an indifference to correct centric relation and the importance of a balanced occlusion. Moreover, serviceable teeth were not always restored to normal function; and denture movement in function was ignored time and again.

Finally, patients were never advised how to care properly for and use their appliances. The writer knows of a case where the patient did not remove her denture for a period of three months—not even to clean it.

Preparation of Mouth

Doctor V. L. Steffel feels that adequate preparation of the teeth and underlying structures before impressions are taken, should include:

1. Restoring carious posterior abutment teeth with cast crowns

2. Correcting malposed or overcontoured teeth by grinding, or with restorations

3. Balancing the natural occlusion

4. Surgical intervention where tuberosities or tori interfere with design

5. Cupping incisal enamel corners for reception of an incisal embrasure hook or rest for indirect retention

6. Preparing rest areas with positive seats in tooth structure or in metallic restorations

7. Surgically removing hypertrophied tissue about teeth requiring clasps

8. Providing occlusal embrasure space or gold inlay where clasp must be used in a tight occlusion

9. Preparing crowns or inlays for abutment teeth with excessive long axis inclination

10. Giving prophylaxis

Stimulation of Supporting Areas

Another important principle to be observed is mild function or stimulation of the restoration to the supporting tissues.

Slight denture motion during function produces a stimulating and favorable response of the tissue supporting a denture. Excessive motion or force applied to this tissue results in resorption of bony support with creation of further untold sequelae, says Doctor S. G. Standard.

Changes in age, health, and physical resistance of the patient are the determining factors regarding the ability of the tissues to tolerate the burden of added function.

Like other prominent denture prosthetists, Doctor C. H. Schuyler advocates reducing the application of force to areas of support by:

1. Reducing the size of cutting surfaces of artificial teeth

2. Maintaining or increasing the sharpness of these surfaces

3. Reducing the number of artificial teeth in the restoration

4. Eliminating torque, leverages, and wedging of abutment teeth

5. Diminishing horizontal forces by reducing lateral tooth inclines

But, as noted in an earlier article, he differs in the method of distribution of force. In contrast to the stress-breaking school of Doctor A. Loos and the functional rebasing discipline of Doctor O. C. Applegate, Doctor Schuyler favors the broad stress distribution. Accordingly, he advocates:

1. Covering the greatest possible tissue-bearing area

2. Psysiological adaptation of saddles to the tissues

3. The use of occlusal lugs or rests, dividing occlusal forces between the saddle-bearing areas and the remaining natural teeth

4. The use of favorable types of clasps in sufficient numbers to distribute lateral stresses between the abutment teeth and the saddle-supporting areas

5. The maximum distribution of occlusal stress in centric and all eccentric jaw relations.

Establishing Occlusal Harmony

The establishment of occlusal harmony is another important principle to be observed in order that the remaining natural teeth be preserved and utilized constructively for as long as possible.

Doctor S. C. Miller and other noted periodontists have admonished that an abnormal burden carried by a limited number of teeth endangers their supporting structures.

Likewise, full denture prosthetists have proved beyond doubt the value of balanced occlusion in minimizing the resorption of the osseous structures supporting these appliances.

Occlusal stresses should be directed parallel to the long axes of the supporting teeth; therefore tooth inclines should be reduced. Both natural and artificial teeth with steep and interlocking cusps are contraindicated because of excessive lateral or anteroposterior stress on abutment teeth and ridges.

Adequate surface coverage is of marked significance in partial denture construction as well as is full prosthesis. Doctor A. Bartelle states that the importance of the retromolar pad of tissue with its underlying structures has often been overlooked.

The soft character of the mucosa and the resiliency of fibrous attachments in the submucosa make this pad of tissue ideal for postdam, of vital importance in mandibular full denture and extension saddle retention. The dense bone below these structures affords support for the denture and resists the forces of mastication.

Doctors O. C. Applegate and R. O. Nissle suggest that doubtful abutments may be strengthened by splinting multiple teeth (soldering adjacent restorations at the contact point).

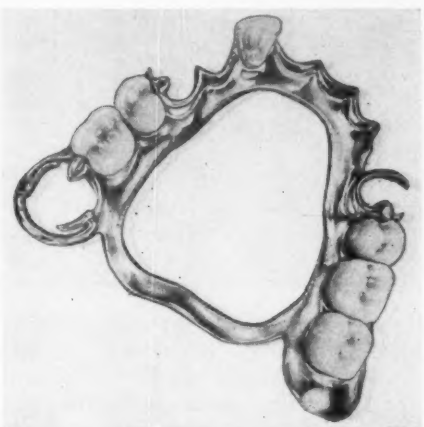
These authors also claim that a metallic base is more conducive to a healthy mucosa covering the ridge than a base constructed of resin. Although this fact has not been definitely established, the advantage in using the resin base lies in the fact that it can be more readily rebased if resorption does occur.

Axis of Rotation

In order to produce stability, another important principle to be observed is the consideration of proper rotating axes or fulcrum lines.

Normally, the forces that tend to displace a denture not in function, are slight. Here, a short arm or indirect retainer may be adequate. However, under the stress of mastication, abnormal forces are produced, resulting in excessive leverage, which may unseat the denture or cause injury to the supporting structures.

Accordingly, Doctor Schuyler suggests that when anterior and posterior abutments are used in a bilateral case, rests are placed to the greatest advantage when the anteroposterior axis passes through the center of the ridge or nearer the buccal cusps of the restored teeth. Should the axis be



lingual to the replaced teeth, instability of the denture may be the result.

Another classic example cited by Doctor Schuyler is the placing of two central incisors on a prosthesis, with clasps and rests on the first bicuspids. In this case less injury would result by using rests on the lingual side of the lateral incisors also, small inlays having previously been inserted to give a definite seat for the rests.

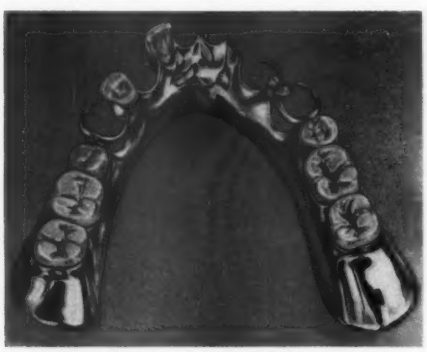
Although the lateral incisors would take the greater portion of the incisive force, the latter would be in line with the long axis of the bicuspids and cuspids, thereby resisting force in an anterior or forward direction.

Doctor A. R. Frechette says that the amount of force imposed on the denture may be reduced by maintaining the sharpness of tooth cusps and by decreasing the size of the food table. Placing teeth directly over the ridges or slightly to the lingual side of the crest improves denture stability.

Clasps

The main functions of a clasp, state Doctors V. R. Trapozzano and G. R. Winter, are to transmit occlusal stresses along the long axis of the tooth, distribute stresses over the greatest number of teeth, maintain clasps in predetermined position, act as an indirect retainer and redivide lever action, and prevent formation of periodontal pockets by proper deflection of food.

Clasps act as a primary retainer and aid in distribution of lateral stresses. If the clasp fingers exert a continuous pressure when they are in place, a degenerative change will result. The clasp arms should be rigid so that when lateral forces bear on the appliance, they will be opposed by both mucosa and abutment.



A palatal bar must be rigid to distribute stresses from one saddle to the other, or to the teeth on the opposite arch in the case of unilateral partial dentures. Where the remaining maxillary teeth are unable to carry a substantial share of the load, a wide palatal bar may be used to place more of the pressure on the mucosa.

The lingual bar must be rigid, so as to distribute lateral stresses properly between abutment teeth and saddles. The greater the area covered by the saddle, the less will be the occlusal stress per unit area. The saddle should end about 3mm. away from the free gingival tissue when adjacent to an abutment tooth.

According to Doctor Standard, it is sometimes desirable not to cement cast crowns to be used as abutments, but to remove them with the impression. This permits the use of a deeper and more precise lug seat. It also allows for the realignment of the walls of the castings, thereby giving a better path of insertion.

To obtain esthetics and retention without limiting movement of the denture base, he recommends construction of a modified clasp which uses two parts: (1) a square key which fits into the distal surface of the crown or the three-quarter retainer, and (2) a modified Roach clasp placed on the lingual surface and fitting into a horizontal groove cut into the crown or three-quarter casting.

This is called "a stabilizing square seat attachment," which permits the denture to move both vertically and horizontally and still give the necessary amount of retention.

Saddle Design

Like Doctor Schuyler, Doctor A. H. Schmidt stresses the importance of good occlusion. He says that well-designed dentures may fail, while those with poor clasp and saddle construction and design

may serve surprisingly well, depending upon poor or excellent occlusion, respectively. Nevertheless, the importance of saddle design cannot be minimized. Saddles, because they are supporting devices, resist vertical masticatory pressure against the alveolar ridges.

Saddle flanges, resting against the lingual buccal or labial sides of alveolar ridges, should provide bracing support against horizontal displacements laterally, anteriorly or posteriorly.

The rugae area, too, except toward the crest of the anterior ridge, is frequently a useful bracing surface for forward thrusts because of its firmness and relative immunity to change.

Doctor Schmidt feels that a lingual plate resting against this surface may function as the lingual or buccal flanges of saddles on defined ridges to prevent lateral displacements.

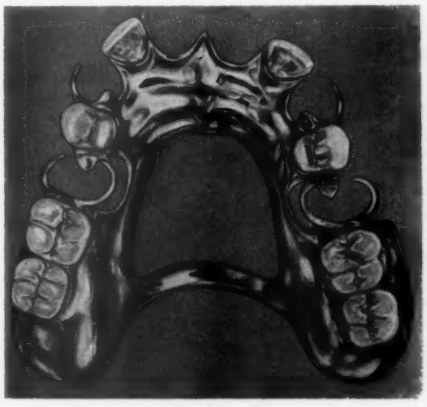
Tooth rests also may function as supporting elements, serving to resist the vertical movement of saddles into the mucosa.

When no anchor or abutment teeth are available at the opposite ends, extensions of the base to rest against the surfaces of the teeth on the opposite side of an axial line between the clasps will hold the saddles in their seats against the ridges. Such parts of a denture are known as indirect retainers.

Connectors

Connectors, such as palatal bars, lower lingual bars or plates, and labial bars join posterior saddles or, in unilateral cases, connect the posterior saddle with an anchorage on the side of the arch opposite the saddle. Among these connectors must be included all the smaller bars or struts used to join nearby saddles or to support or reinforce clasps or indirect retainers.

Furthermore, each part may have a special function in keeping a partial denture in position, and some parts may perform several functions. A good example is the "continuous lingual clasp" which serves as an indirect retainer, as a brace against lateral movement and, if it carries one or more anterior teeth, as a tooth rest or support.



Tooth rests, stops or lugs are intended to resist movement of a denture by vertical masticating pressure. As a general rule, every tooth, clasped or not, if it is adjacent to an edentulous area, should carry a rest.

Since they are subject to vertical dislodgement by a number of oral forces, dentures must be provided with rentention. In every case the clasp should embrace the abutment teeth to prevent drift and provide proper bracing, support and retention.

Force of Gravity

With upper dentures, regardless of their weight, the force of gravity must be considered. In the case of upper and lower partial dentures, movements of the cheeks, lips and tongue tend to dislodge the appliance. In addition, patients wearing "loose" dentures have a habit of moving them with the tongue. Finally, there is the possibility of unseating them by the wedging of a large bolus of food between the denture and the lips or cheeks or the pulling action of sticky foods.

Presence of the remaining teeth makes it impossible to obtain the tissue adhesion that holds full dentures in their seat. Therefore, natural teeth must be used for anchorage by means of retaining devices.

As direct retainers, clasps prevent vertical displacement of parts of dentures to which they are directly attached. They depend on two principal factors for effectiveness: (1) contours of the crowns of the anchor teeth, or the angles toward which they lean; and (2) physical properties of the clasp metal.

To provide adequate retention, one or both of the terminals or arms of a clasp must possess enough elasticity to spread open and pass the opposing projections representing the contours of the anchor teeth and then close about the undercuts.

The master cast should be surveyed to locate the undercuts and determine the most favorable areas for retention. The position of the clasp guide lines can be changed by varying the angle at which the cast is tilted. The angle determines the path of insertion of the denture to facilitate placement and removal from the mouth, in one direction only, parallel to the vertical mandrel of the surveyor. (Editor's Note: Clasp and rest design will be covered definitively in subsequent articles.)

The importance of the supporting structures of the teeth is further attested to by Doctor I. Glickman, who states that alveolar bone is dependent on functional stimulation for its preservation.

However, there is a physiological limit to the masticatory forces it can withstand, in order that there be no disturbance in the equilibrium of bone deposition by osteoblasts and bone resorption by osteoclasts.

If stresses exceed this tolerance point, the equilibrium is disturbed and osteoclastic action becomes predominant, resulting in bone destruction.

Maintenance and adaptability of alveolar bone are also constantly subject to a systemic regulatory mechanism known as the "bone factor."

Old age, malnutrition and postmenopausal changes, for example, inhibit the individual formative capacity of bone, and so favor atrophic changes in all bones.

This bone factor regulates the cellular activity which make possible accommodation to existing functional requirements and to increased functional demands.

Finally, Doctor L. Blatterfein suggests that to support a partial denture properly, residual alveolar

ridges as well as natural teeth must be utilized. Ridges are employed for this purpose by the base of the denture which consists of saddles and connecting bars. The saddles should have maximum coverage of all available bearing areas. The connecting bars serve to transmit stress and to connect saddles.

To effectively perform these functions, the bars must: (1) have maximum rigidity; (2) avoid contact with resistant nonbearing areas; and (3) have minimum bulk commensurate with function.

Dr. Blatterfein feels that the upper jaw presents greater problems in base design than the lower jaw. Limitation of the palatal flange of the saddle must be considered in saddle outline, and the presence of resistant nonbearing areas must be considered in connecting the bar outline.

He advocates the following five-step procedure in the design of any upper partial denture base:

Outline of Primary Bearing Areas (saddles): Here, saddles are extended buccally to the limit of the mucobuccal fold in function, and palatally, to the angle of intersection of the horizontal plane of the roof of the mouth and the inclined plane of the alveolar process, where there are resilient pads of adipose and glandular tissue.

Outline of Nonbearing Areas: Lingual gingival tissues, tori and palatal tissue posterior to the vibrating line of the soft palate, must be avoided.

Outline of Bar Areas: These are any mouth areas not included in the outline of the primary bearing or nonbearing sites.

Selection of Bar Type: An analysis of the following controlling factors, governs the selection of the bar type: mouth comfort; rigidity; saddle location; and indirect retention.

Unification: This process consists of joining the primary bearing areas (saddles) with the selected bar type, confining the connection to the available bar areas.

Answer to TIC Teaser—page five

DENTURES	CELLIST
IDENTITY	INSISTS
INDENTED	BRISTOL
AIRDENTS	CISTERN
ACCIDENT	ISTHMUS

NEXT MONTH: PART FIVE

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TROUBLE IN PARADISE

News note from *Life*: "A doll . . . with a plastic human jaw complete with rotten teeth is under consideration by toy manufacturers. . . . The child fills the cavities with plastic."

Home once was home and home was sweet,
A place to which I could retreat
And rest secure. And it was jolly
To watch my child take "tea" with dolly.
My office tasks no one would mention—
But now this treacherous invention!
Oh, no! Don't meet me, darling tot,
With dolls whose little toofies rot!

Don't ask my help with plastic mix,
I like to rest some after six!
How about a doll that talks,
Or belches, bites your fingers, walks,
Or one whose pinky nose will run?
For Daddy won't have any fun
If home's a place where he will still
Find patients with more teeth to fill!

Helen Harrington